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The Local (Public) Transport Plan as an Approach to optimize Urban Public Transport Planning in Iran

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1 Introduction to Local Public Transport Plans (LTP)

In 2009, approximately 50% of the world population resided in cities (UN, 2010). In most countries the anchor point of urban population growth shifted away from the primary to the secondary agglomerations. As result, in near future, the number of cities in developing countries in need for extended basic urban infrastructures will rise. In this regard, it is especially the urban transport system that determines to a great extent the economic, social and ecologic welfare of a city.

In many countries, the exclusive concentration on a simple extension of the road based transportation network led to growing individual car traffic hence to additional demand for roads and striking external effects of transport. All issues have a severe negative impact on the living and working conditions within many urban centers.

In the last decade, especially in the MENA (Middle East and North Africa) region, municipalities tried to restrict continuous growth of car traffic and intensified their efforts in supporting alternative concepts with focus on environmentally-friendly mobility approaches. However, many of these approaches were quite ambitious and innovative but often rather implemented in a disintegrated way. One reason lies in the clustered organizational structure of the municipalities' planning sections and their disintegrated working style. Especially in developing countries, the role and the borderline of responsibilities between the different departments is often not clear. Moreover, the World Bank supported privatization wave of the 1990s led to even more intransparent structures in municipalities worldwide. The resulting semi-private state-owned transportation companies are often following their own policies in regard to service, quality standards, working conditions etc.

The transportation master plan, as the common planning instrument in municipalities all over the world, usually focuses the technical and construal aspects of the public transport system, while the organization of every-day services is not considered deeply enough.

As a result, the often different public transport operators do not cooperate with each other, quality standards vary, service offers are not harmonized, inter-modality is not guaranteed and ticketing as well as marketing concepts are not in line with each other.

In many cases these very difficult to understand systems prevent, especially potential new users, from changing mobility routines towards a regularly use of public transport or cycling. This, moreover, supports the often negative image of the public transport as the mean of the poor.

The transport research activities that have been conducted during the project runtime of the Young Cities in Iran project within in the BMBF (German Federal Ministry of Research and Education) funded Megacities program investigated the urban transport sector of the MENA region in general and the one of Iran in detail. The researchers revealed that the Iranian urban public transport planning system is lacking coordination between the level of the urban transportation master plan and the level of public transport operators.

As a result and way to document especially the developed soft-policy issues of the public transport concept for the New Town of Hashtgerd the researchers decided to adapt the tool of a Local (Public) Transport Plan (LTP) and transfer it to Iranian conditions.

This tool is already used by many municipalities worldwide to define standards and goals for the local public transport operators.

This brief guide will provide a short introduction of the tool, explain why it could be an improvement for the Iranian public transport planning system and where to place it within the system.

2 Urban Public Transport Plans

A short illustration of various examples will help to understand and compare the variety of Local Transport Plans.

There are a lot of cities dealing with transport planning in general, but only few of them established consistent plans for local public transport. Some good examples can be found in Cities such as Berlin (Germany), Copenhagen (Denmark), Bristol (Great Britain), Vienna (Austria), Lille (France) or Den Haag (Netherlands). The presented “best practice” examples have all weaknesses and strengths but contribute to the model of a consistent LTP.

Regarding the definition of a suitable planning area and inter-municipal cooperation there are many good examples in the United Kingdom. The city of counties (Councils of Bath & North East Somerset, Bristol City, North Somerset, 2006). It includes comprehensive surveys and data collections and illustrates opportunities to deal with identified problems (ibid.).

A good example for the integration of the planning process into a local trans-sectoral concept can be found in the city of Lille in northern France. Transportation was also part of the developed vision of an attractive and economically successful city that is currently facing an urban renewal debate. At the very beginning questions were addressed to actors and citizens including specific traffic topics. The status analysis and different scenarios have been important contributions to the joint development later on (Lille Metropole, 2000).

In reference to the integration of policy required, the current traffic plan of the Dutch city of Den Haag shows in particular how to handle urban development and traffic in an integrated way. The enhancement of spatial qualities as well as accessibility and mobility in general is supposed to be. People responsible for facing these challenges are acting jointly across various city departments (City of Den Haag, 2001).

The city of Copenhagen provides an example of a comprehensive public participation and involvement of actors. The transport and environment plan of the city consists of 20 domains, which have been defined on the basis of an intensive participation of citizens and actors. The development of a well operating and efficient transport system that reduces the environmental impact significantly was a key objective in the discussions. As methodological elements of the participatory process instruments like workshops, interviews, public discussions and surveys were used (Hansen and Torslov, 2007).

The city of Berlin is a good example of effective involvement of stakeholders in strategic planning processes as well. Thus, the senate has a lot of positive experience with a so called “round table” in preparing the LTP, which includes representatives of the involved administrations, political parties and various other groups. Therefore, sustainable compromises can be developed and transferred into an action plan (Hansen and Torslov, 2007).

Regarding the setting of indicators and target values the city of Vienna presents an interesting idea with its transport master plan. The plan provides a direction for the transportation development over the next 20 years while following five principles of “Intelligent Mobility”. These principles are: sustainability, innovation, cooperation, acceptance and effectiveness. Furthermore, it mainly contains concrete goals to be reached. Guiding criteria (command variables) will be developed in order to monitor the progress. They have to be collected and displayed obligatorily (Magistrat der Stadt Wien, 2003).

Management of derivations of specific packages of measures and budgeting has been exemplified in the already mentioned joint local transport plan of west England. The plan contains a detailed action program which considers strategic goals, the value for money and measurable target values. In addition, budgetary items are displayed for the various domains (Councils of Bath & North East Somerset, Bristol City, North Somerset, 2006).

With regard to the evaluation of planning processes and implementation of actions, the fact that this has become standard practice the UK and France should be noted. Results are used to identify problems in implementation and to act against them, respectively. Furthermore, they are used to optimize future planning processes. In this manner the cities Copenhagen and Vienna are good examples, too.

The LTP of Berlin regulates the planning of public transport in the capital of the Federal Republic of Germany. It probably represents the most detailed and most consistent Local Transport Plan in Germany. In order to get a deeper insight into local public transport plans the case of Berlins LTP will exemplify the consistency of a good LTP. For this reason, its content and structure will be explained exemplarily.

The Berlin LTP mainly focuses on appointing minimum standards for public transport services in Berlin. Therefore, it contains for example mandatory requirements and standards towards accessibility (density of stops, ways to stops, frequency and schedule of operation, travel times, change frequency), quality (safety, punctuality, environmental standards, barrier-free accessibility), integration of the transport offered (combination of rail and bus with the urban hinterland and bicycle traffic). Based on that, the LTP identifies concrete actions that ought to achieve the minimum standards formulated. An analysis of expected effects and costs, caused by actions, as well as an appraisal, evaluating the adequacy of actions, tops the plan off.

The Local Transport Plan is directly binding to the Berlin senate. All authorities have to consider the standards and specifications of the LTP in their decisions. This especially applies to the Senate Department for Urban

Development in its role as public transport authority. In the process of ordering transport services due to existing transportation contracts and in acquisition of new transport contracts the department is urged to implement the specifications mentioned in the LTP (Senatsverwaltung für Stadtentwicklung und Umwelt, 2007).

Similar to LTPs of other big cities, the structure of the Local Transport Plan goes along the guidelines for developing a LTP. According to the development of such a plan the structure is planning project orientated. It covers fundamentals, a system-analysis and outline conditions of services offered. A supply planning is an essential ingredient as well as the enforcement of individual measures and an effectivity analysis. The development process of such a plan is usually consisting of five different steps as illustrated in Figure 1.



Fig. 1: Development Steps of Berlins Local Transport Plan

1. Basic Conditions

Initially, fundamentals are pointed out by giving some information and basic knowledge about e.g. the system and the different types of services. It is not only about explaining framework variables and formulating goals of the presented plan but also about goals in general and the implementation of the preceding plan. Participation processes play an important role in developing the LTP. They are commented at the end of this section.

2. Analysis of the Transport System

Next major step is the analysis of the transport system. It investigates the transport supply on the one hand and considers important points like network structure and city-suburban traffic. On the other hand the system analysis takes account of the demand for transportation. Therefore, influencing factors (mobility, traffic volume, demand and capacity utilization in the near past) are evaluated. Analyzing weaknesses in accessibility and quality is mainly done by focusing on crucial points like service quality, connectivity and quality of interconnection (accessibility weaknesses) as well as reliability, accuracy and security (quality weaknesses). In addition, the environmental protection is verified; perception of the transportation system by the customer figured out.

3. Specification of Services

Core aspects of the design of planned supply are ultimately processed in the outline conditions of offered services. After setting outline condition in reference to modal integration of different modes of transport, a wide range of standards are assigned that determine the offer in many ways. Thus, accessibility and quality standards are set. Supplementary, standards of environment protection are explained. Completing this section, information on product strategies and tariffs/sales are given.

4. Supply Planning

The supply planning is addressed to the transport demand and defines the outline conditions for fixed networks and schedules. Finally, it deals with the supply of various modes of transport that are discussed in detail. Hence, it distinguishes mainly between categories of regional transport, city train, underground, light rail, ferry and bus. There are extra bullets in order to fix night services and suburban traffic.

Dealing with selected problems, the penultimate chapter “Individual Measures” focuses on the development of solutions through single tasks. These are e.g. the extension and improvement of stops and stations, increasing the speed of LRT and Bus and integration of services and mobility management.

5. Monitoring and Evaluation

Ultimately, the effectivity analysis considers what measures have been implemented successfully. It discovers structural weaknesses and existing elements with need for improvement. Input of this analysis is an accurate monitoring, that leads to a continuous optimization of services by evaluation of impacts.

This description of the Berlin LTP pointed out how a local public transport plan can deal with the challenge of analyzing, planning and offering a consistent city-wide transport system.

3 Setting Transport in its Wider Context

Local transport strategies need to be joined up with the wider planning and policy framework at the corporate level. Therefore it is recommended to incorporate Local Transport Plans into a directly related long-term strategy (Figure 2). Since the long-term vision of an area (e.g. housing growth, commercial activity etc.) plays a vital role, regional spatial strategies (RSS) and regional transport strategies (RTS) should be considered, too.



Fig. 2: Local Transport Plan and Long-term Strategy

The purpose of the LTP is then to translate the local Transport strategy into a policy implementation program.

The development of a local transport strategy and a Local Transport Plan must be a corporate activity of the whole local authority. Plans, targets, policies and objectives delivered by other areas of local government have to be drawn up in a way that is broadly consistent with the LTP to ensure that locally made decisions are compatible with the LTP objects and targets.

In concern of the LTP it is necessary to involve local people, the local business community etc. to maximize local support for the LTP.

Questioning how best to involve regional bodies in decisions is fundamental in regional planning context. The LTP should be prepared in the context of wider objectives and policies that are set out in Regional Spatial Strategies (RSS), which incorporates Regional Transport Strategies (RTS). RSSs and RTSs should aim to deliver a full integration of regional and local planning (housing, land use etc.). Therefore the RTS has a key role in relation to LTP which policies and priorities should be consistent with those set out in the RTS. In this manner the horizontal and vertical integration of the LTP

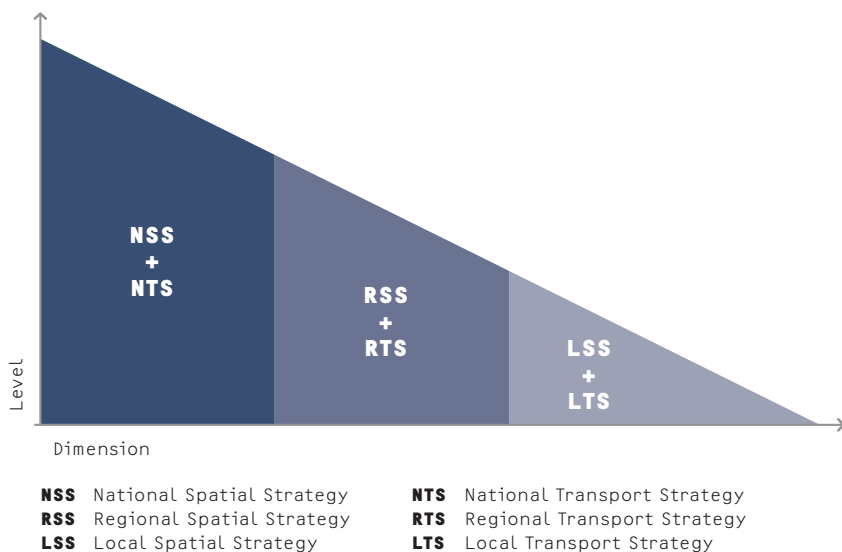


Fig. 3: Horizontal and Vertical Integration of the Local Transport Plan

is essential (Figure 3). If transport measures requiring action at the sub-regional or local level, local transport authorities should consider detailed proposals for achieving the outcomes set out in the strategies. Cross-boundary and sub-regional transport planning play an important role as well. LTP proposals should not be artificially constrained by boundaries, but should respond to cross-boundary local transport needs and opportunities. Therefore inclusion of trans-boundary authorities and coordination is needed. Local Transport Plans can only be effective when their implementation programs broadly match the resources available to deliver those programs. Thus there is a need for realistic expectations about investment levels.

4 Locally Relevant Targets

Where possible, LTP targets should relate to outcomes (real and measurable improvements in quality of life and quality of transport services). All targets, but especially targets for outcome indicators, should aim to be challenging but realistic at least. Moreover traceability—to understand how authorities have reached these decisions—is very important.

Making the best and most sustainable use of infrastructure must be a goal of every LTP. It is usually more economical and more effective to use existing structures rather than inventing new ones.

Identifying local problems and opportunities is another challenge. Analyses of problems should not be restricted to existing problems, but should also attempt to anticipate and prevent any emerging or potential problems. One goal is always the aim to identify and tackle the root causes of existing or emerging problems.

5 Indicators and Trajectories

Setting robust indicators and trajectories is vitally important relating to local transport. They are the measures against which the success of local transport planning will be judged. Some best value performance and mandatory indicators are e.g. principal road condition; total killed and seriously injured casualties; public transport patronage and satisfaction; accessibility; area wide road traffic mileage; congestion and air quality. Often it is not easy to select the targets and indicators that should be part of the LTPs. In dependence to size and characteristics of the area the optimum number of indicators of all kinds in an effective set is generally to find between twenty and forty. Authorities should also set trajectories, with annual milestones, for all LTP targets. This information would be most helpfully expressed in the form of a simple graph for each target. The trajectories set in new LTPs will become the key reference point for annual monitoring of progress in future and will enable local authorities to make better assessments of whether or not performance against each target is on track.

All this consequently leads to the annual progress report that ensures processing and upgrading the LTP through a report on progress towards targets against trajectories.

To meet the requirements of constructing a consistent Local Transport Plan it is absolutely necessary to develop a reasonable pattern of utilization. The following structure gives an impression of a potential design of this pattern along international guidelines:

1. Clarifying Goals

Main targets (goals, national goals and challenges as well as relevant regional objectives).

2. Identification of Problems and Priorities

Identifying problems and priorities on the basis of clear evidence and data (e.g. demographic and socio-economic trends, environmental issues, economic circumstances, existing transport infrastructure capacity, travel patterns and trip rates).

3. Time scale of the LTP

Setting the target in a realistic way.

4. System Analysis

Checking transport supply and demand

5. Measure Generation

To meet the challenges, solve analyzed problems and to achieve objectives, a wide range of measures must be generated. This does not only imply infrastructure projects. Common measures are, for example:

- Smarter choices options (e.g. school, workplace, and individualized planning, teleconferencing, teleworking, etc.),
- Congestion reduction schemes, such as workplace parking levies and road user charging,
- Improving overall levels of accessibility to and from employment and key services,
- Developing freight quality partnerships,
- Developing of work place and school travel plans to reduce emissions from car journeys, improve air qualities and promote health,
- Improvement of public transport services to reduce congestion,
- Better integration of transport and spatial planning to reduce the need to travel,
- Working with partners to change the way key services such as highway maintenance and street lightning are delivered,
- Development and implementation of road safety strategies, training and publicity, particularly for vulnerable users,
- Development of inclusive transport schemes to improve walking, cycling and public transport access,
- Noise management schemes through engineering and maintenance, implementation of noise action plans,
- Improvements to public transport services through working in partnerships with local transport operators,
- Schemes to enhance urban and rural streetscape design,
- Schemes to improve signing, travel information, ticketing and ease of interchange,
- Developing and improving an accessibility strategy that contains inclusive partnership-led solutions,
- Partnership working to promote social inclusion,
- Consider the role of concessionary fare schemes,
- Solutions to urban accessibility issues such as better information provision through branded public transport schemes,
- Support the use of rail and water for the movement of people and freight

6. Appraisal of Transport Options

Appraisal, prioritization and packaging of measures in order to maximize the overall benefit.

7. Selecting Options

8. Developing and Monitoring the Plan

Strategic Environmental Assessment (SEA) is one way to develop and monitor the LTP.

9. Health Impact Assessment

Mitigating negative effects on health and well-being is an objective as well. Therefore a Health Impact Assessment (HIA) is useful.

10. Consulting and Involving Stakeholders

Consultation and involvement should extend not only to local businesses and residents but also to visitors. It moreover supports the general acceptance of the proposed measures and helps minimizing conflict potentials.

11. Partnership Working in Planning and Delivery

Partnerships help developing policies offering more strategic outcomes for a wide area.

12. Integrating Relevant Plans and Duties

There are a number of plans and duties that need to be reflected and integrated in Local Transport Plans. These are for example Network Management Duty, Transport Asset Management Plan, Air Quality Action Plan, Rights of Way Improvement Plan, Noise Action Plans, Bus information duty, Local Economic Assessment Duty, Children and Young Peoples Plan, School Travel Strategy, Disability Equality Duty, Local Development Frameworks, National Park Management Plans and AONB Management Plans.

13. Supplementary Documents

To maximize effectiveness, ensure a concise LTP and to explain policies in particular supplementary documents are needed. They can help to concretize topics that were brought up (e.g. walking, cycling, accessibility, parking, freight, buses, road safety, traffic reduction).

14. Equality Impact Assessment

The EQIA (Equality Impact Assessment) will help to ensure the LTP addresses anti-discrimination and equalities legislation and take account of the impacts the plan may have on the local community.

6 The Iranian Transport Sector

6.1. General Key Figures of Transport in Iran

In Iran the degree of motorization is about 200 cars/1,000 inhabitants (ISNA, 2012). In comparison to Germany, with a passenger car density of 566 cars/1,000 inhabitants (BMVBS, 2008) Iran is a low-motorized country. Certainly, there are differences between rural and urban regions: In urban regions the car density is higher than in rural regions.

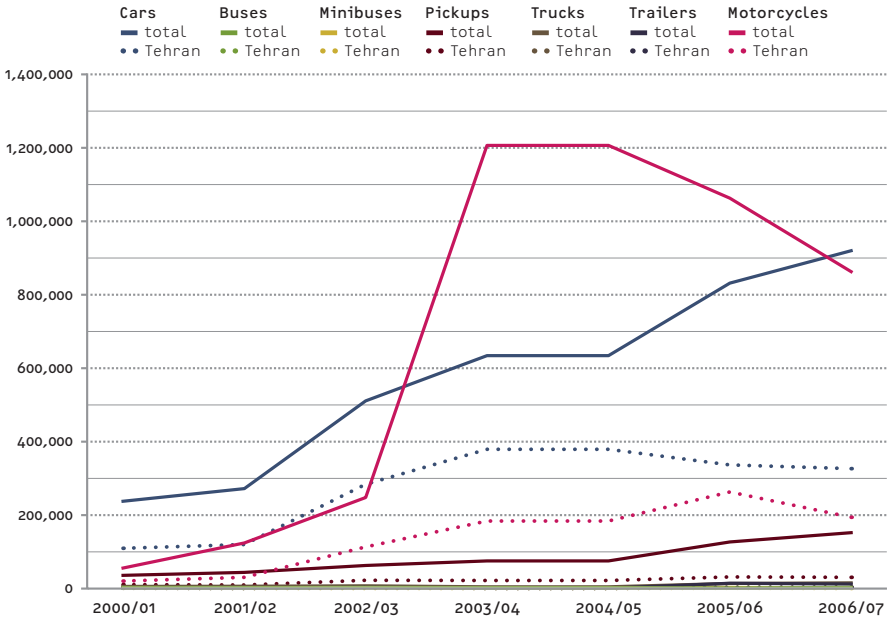


Fig. 4: Newly Registered Vehicles in Iran 2000/01–2005/06 per Type and Ostan (SCI, 2006/2007)

Figure 4, illustrating the number of vehicle registration between 2000/01 and 2006/07, shows that the stock of private vehicles has grown continuously. Most of the rapid growth of private motorization is taking place in urban areas.

Possible reasons for this development are:

- Uncontrolled growth of urban population and related additional need of basic transportation services,
- Modernization and adaptation of western consumption patterns,
- Municipal planning and construction efforts were mostly focusing on road infrastructure,
- Privatization of public transport operators and outsourcing of central municipal services.

6.2. Urban Transport

The urban transport in Iran is strongly determined by the framework conditions reported before. The rapid growth of cities encourages and the accompanied urban sprawl favors the car use. Furthermore the better economic conditions in the recent years on the one hand and the subsidization of fuel on the other hand contributed to this trend (World Bank, 2003). Even if the subsidization scaled down at present, the proportion of motorized individual traffic, especially in urban areas, is high.

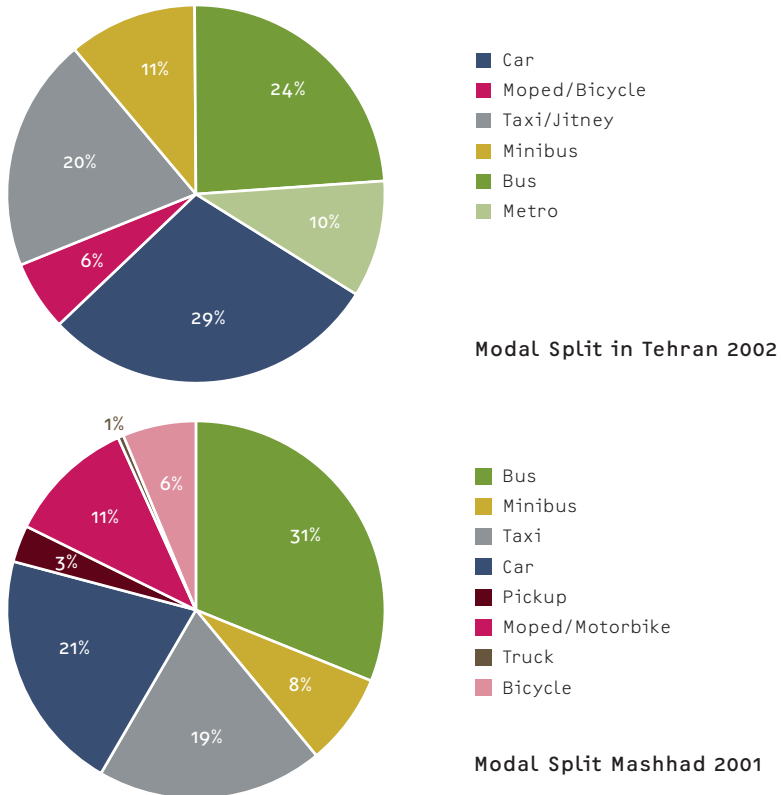


Fig. 5: Modal Split in Tehran and Mashhad (Gharib, 2002)

Measures to create or improve the public transport more often than not lags behind the demands evolving out of the fast urban expansion. Also the road network is not able to meet this increase—crowded roads and congestions are daily occurrence. The majority of public transport is done by bus or minibus. Beside private cars there are many mopeds and motorcycles in Iranian cities (Shahinfar, 2011). The space for non-motorized traffic is severely limited (World Bank, 2003). In Figure 5 the modal splits of Mashhad and Tehran are shown. The proportion of pedestrian transport is not even declared. It also becomes clear that pedestrian traffic plays a minor role for Iranian planers.

Moreover, it is no surprise that traffic is one of the main causes of air pollution in Iranian cities. In Tehran for example, motorized traffic is responsible for 80% of the air pollution (Shahinfar, 2011). A further problem in Iranian Transportation is the lack of discipline (Gharib, 2002). As mentioned already, the rate of road accidents and the number of people dying in traffic is one of the highest worldwide. A peculiarity in Iran represents the urban taxi traffic. Taxi traffic can be understood as an intermediate form between public and individual traffic. The proportion of taxi / jitney traffic on modal split is between 19% and 28% (Figure 5). In order to solve problems like traffic congested streets, air pollution or overcrowded public transport vehicles Iranian cities have done a lot in the recent years. Tehran is one of a few cities in the world which implemented a congestion charge (TTC Co., 2012). In 2009 also bike sharing with about 500 bikes was introduced in one district (MetroBike, 2010). Also the BRT System and the Metro should be mentioned in this context. Because of these efforts to improve the quality of life by increasing the transportation system in January 2011 the capital of Iran was amongst the winners of the Sustainable Transport Award (STA) by the Institute for Transportation & Development Policy (ITDP, 2011).

7 Urban Public Transport Planning in Iran and the Integration of the LTP

Understanding the organization of public transport planning and operation in another country is always a difficult undertaking. In all countries worldwide, individual mobility (by foot) is the original style of traveling. Due to the comparatively early introduction of mass transportation in cities of western countries, its issues and planning needs were quite early integrated into the parallel developing institutionalization of city development planning. In contrary to that, most cities in developing countries skipped this intermediate mass transportation stadium. Thus individual non-motorized travel routines were substituted by individual motorized ones. During the 1960's this development was massively supported by development agencies and consultants coming from the western world. The ideas of the car suitable city and affordable mass motorization for everyone were directly connected to development projects focusing on these latter ideas. Since these projects (following catching up development theories) were financed by the countries from the western world, in order not to lose financial support, planners of cities in developing countries had no other choice as to follow this proposed path. This led to a more or less unconsidered adaptation of western planning paradigms.

Now that consequences of mass motorization became obvious in western cities and are, due to different prerequisites, even more severe in cities of developing countries, planning paradigms are changing again. In most cities of Europe public transport systems are experiencing a kind of renaissance.

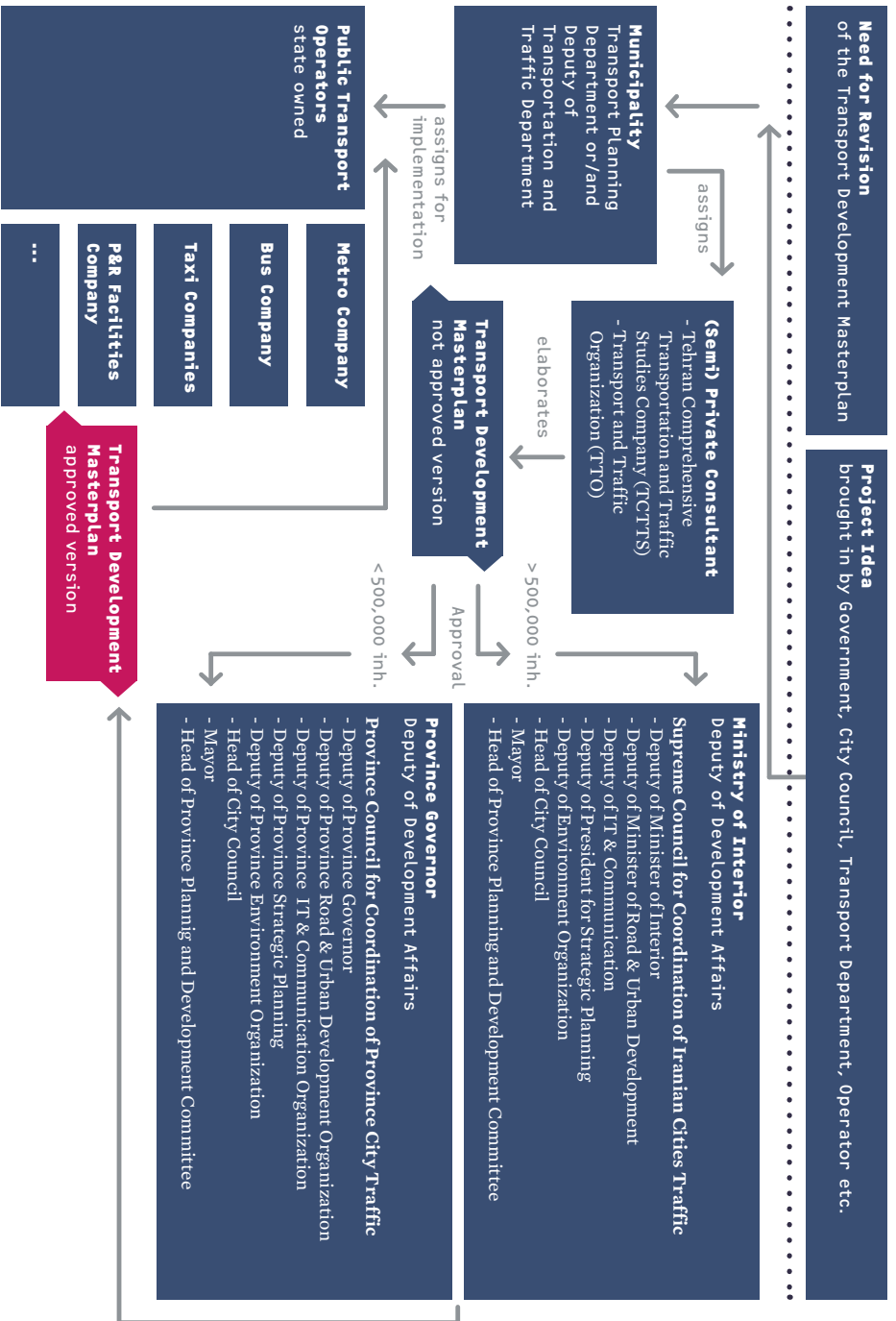
On the opposite site, in a lot of municipalities in developing countries public transport planning has either never been a part of transport planning or the planning institution is due to its structure not able to solve the emerging problems. Since most aspects of planning for individual motorization are focusing on physical regulations (street widths, number of parking lots) and public transport planning needs additional capacities the institutional planning framework of most cities is not able to solve the task of public transport planning. As a cause, urban institutions are now trying to integrate the field of public transport planning into their planning framework. So is Iran, too.

7.1 The Iranian Transport Planning System

In Iran the transport planning framework is also strongly focusing physical planning aspects. Every city with more than 500,000 inhabitants has to elaborate a so called transport development master plan. These master plans have to be updated in five year intervals and are valid on municipal territory, only. In a city's rural hinterland on the contrary, it depends on the spatial importance of a project whether the Province Road and Urban Development Organization or the Ministry of Roads and Urban Development is responsible for planning. Usually, every transport master plan is the product of a (aemi) private consultant which has been assigned by the municipality to elaborate the plan. In the case of Tehran these consultants were the Tehran Comprehensive Transportation and Traffic Studies Company (TCTTS) and the Transport and Traffic Organization (TTO). These consultants were also involved in the elaboration of Mashad and Esfahan transport development master plans. Figure 6 illustrates the structure of the Iranian urban transport planning system. Starting in the upper left corner the central government, the city council, transportation department, a public transport operator or other transport related institutions can address new project ideas to the municipality. Another possibility is the necessity to actualize the transport development master plan. Then the responsible department within the municipality (depends either on the municipal structure and/or on the number of inhabitants) assigns a consultant to elaborate a plan. In the case of Tehran, it is the responsibility of the transport planning department under the supervisions of the department's deputy to assign a consultant. This practice of outsourcing planning works is common all over Iran.

After the elaboration of the transport development master plan the plan has to be approved by a superior council. In case that the municipality has less than 500,000 inhabitants, the Province Council for Coordination of Province City Traffic under supervision of the deputy of development affairs has to approve the plan. In case that the municipality has more than 500,000 inhabitants the Supreme Council for Coordination of Iranian Cities' Traffic within the Ministry of Interior is responsible for the plan approval. These councils are not real institutions. They are rather a committee with deputies from all governmental bodies that are somehow related to transport planning.

After the approval the plan is submitted to the municipality for implementation. The responsible department within the municipality assigns companies or public transport service contractors to implement the plan.



7.2 Integration of the LTP

As shown in Figure 6 there are, depending on the city, several private operators assigned by the municipality to implement the targeted system. The biggest problem is often that every company is working independently from each other and thus follows different quality standards, ticketing systems and marketing approaches. Especially in Tehran, although there is a joined ticketing system of the Metro and BRT company existing, the Tehran Bus company engages private drivers with their buses to fill up service gaps. These private buses are also not able to fulfill or guarantee the same quality standards. Not to mention the different Taxi companies.

A recapitulation of the preceding chapters reveals a clear lack of coordination between the level of transport development master plan and the transport operators. This lack of coordination could be filled by the integration of the LTP into the planning system. An optimized structure with an integrated Local Public Transport Plan is supposed to look like the one presented in figure 7. In this framework the LTP's tasks would be to integrate all independently presented measures from the master plan in one plan and complete as well as harmonize them. Other important tasks would be the integration of regional transport services and the clear definition, implementation and control of quality standards as well as the development of a joint marketing approach together with an approach for a ticketing system for the whole urban agglomeration.

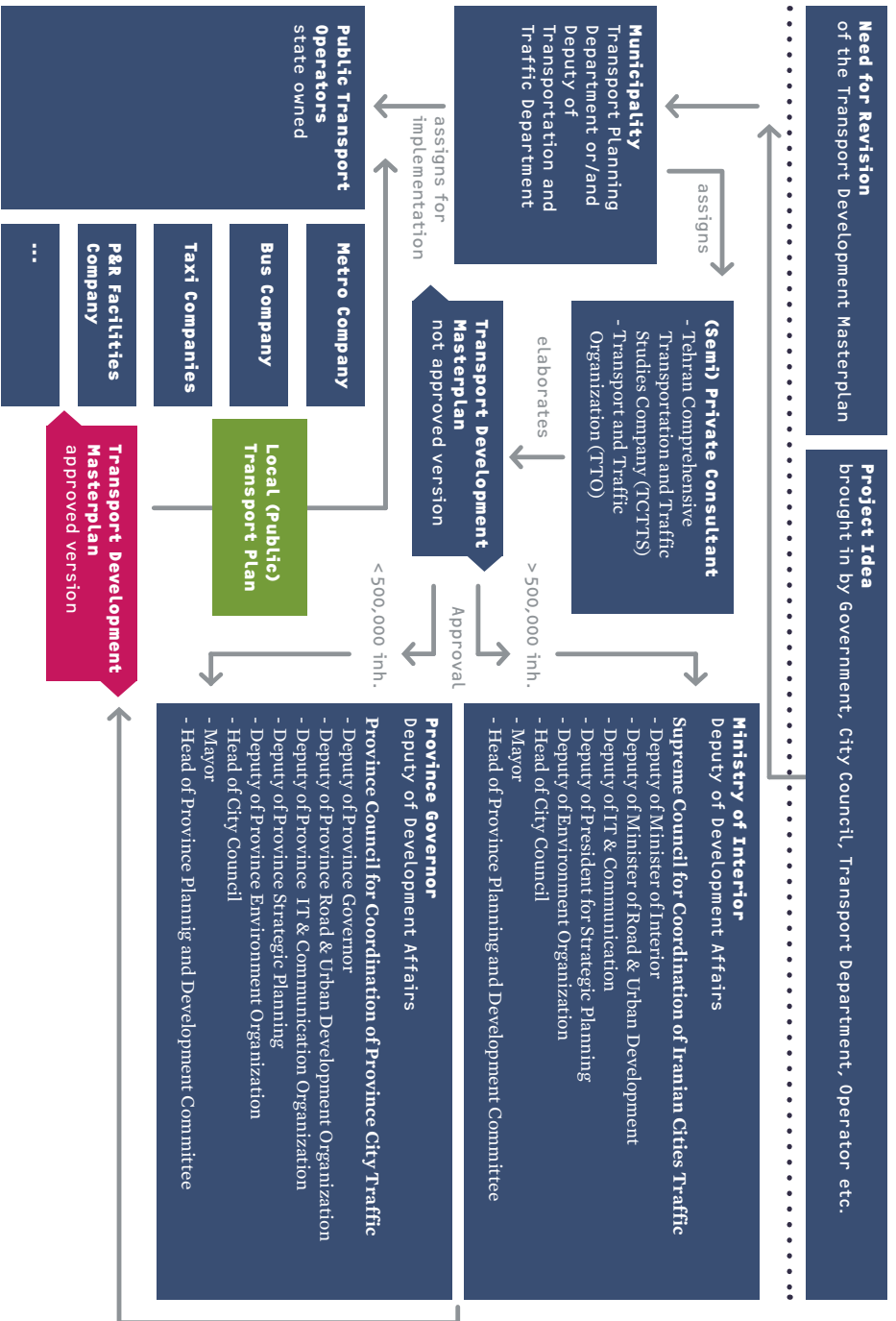


Fig. 7: Iranian Urban Transport Planning System extended by the Measure of the Local Transport Plan (Döge, 2011)

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